Delaware
Economic Development

Manufacture of polysulfones

Description of Technology: Polysulfones are manufactured by reacting a sulfuric acid or sulfur trioxide with a bireactive aromatic compound, using as a "promoter" a carboxylic acid anhydride. The product polymers are useful as molding resins.

Patent Listing:

1. **US Patent No.** 6,548,622**,** Issued on April 15, 2003, "Manufacture of polysulfones"
   http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=6,548,622.PN.&OS=PN/6,548,622&RS=PN/6,548,622

Market Potential: Polysuifones, especially aromatic polysulfones, are important engineering polymers, often having the advantages of chemical resistance, good high temperature properties, good tensile properties, and others. Typical engineering polysulfones are ##STR1##

Reported herein is a method which avoids the drawbacks of the methods described above. In this method, sulfuric acid or sulfur trioxide is reacted with a carboxylic acid anhydride to produce a bisacylsulfate, referred to hereinafter as BAS. BAS is a dielectrophile, that is, it can react twice with nucleophilic compounds. The nucleophile may be an aromatic compound which preferably is electron rich. Use of a nucleophile which can only react once will produce an aromatic sulfonic acid or a diaryl sulfone, depending on the ratio of BAS to nucleophilic aromatic compound used. As described herein, if an aromatic nucleophile which can react twice is used it will result in a polysulfone polymer if a 1:1 ratio of the dinucleophile and BAS is used. The byproduct of the reaction is the corresponding carboxylic acid of the carboxylic anhydride. The byproduct acid may be converted back to the original anhydride which then may be recycled back into the process.

Benefits:

- Retain chemical resistance, good high temperature properties, and good tensile properties
- Can react twice with nucleophilic compounds

Applications:

- Molding resins

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